



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8
999 18TH STREET - SUITE 300
DENVER, CO 80202-2466
<http://www.epa.gov/region08>

Ref: 8EPR-EP

MAY - 2 2003

RECEIVED

DEC 05 2003

DEQ
Planning Division

R. Mark Wilson, Field Supervisor
U.S. Fish and Wildlife Service
100 North Park
Suite 320
Helena, MT 59601

Re: Request for Concurrence on Section 7 (ESA) Findings
Big Creek TMDL/ sediment

Dear Mr. Wilson:

We request your concurrence on EPA's findings relating to EPA's proposed approval of the total maximum daily loads ("TMDLs") listed above, which the State of Montana has submitted to EPA for review and approval under Section 303(d) of the Clean Water Act. The TMDLs are described in the document Watershed Restoration Plan for Big Creek, North Fork of the Flathead River, March 2003 (Montana Department of Environmental Quality.) We believe our approval of these TMDL may constitute an action as defined under 50 C.F.R. 402.02 pertaining to Section 7 of the Endangered Species Act ("ESA").

To aid in your review, we are enclosing a biological evaluation for the proposed TMDL approval. The evaluation provides a species-by-species and critical habitat assessment of what EPA has found to be the potential effects of the pertinent TMDL. We concluded that this TMDL approval either would have "no effect" on or would "not be likely to adversely affect" the applicable species or proposed critical habitat. The evaluation addressed possible effects on threatened and endangered species. Moreover, we have elected to include an evaluation of our action on candidate and proposed species. We realize we have no legal obligation to include candidate species in our evaluation. Rather, our obligation to confer with the Fish and Wildlife Service on proposed species arises only if our action is likely to jeopardize the continued existence of those species. We feel it is prudent, however, to include candidate and proposed species in our evaluation to identify and address those conditions that may lead to future listings of either candidate or proposed species.

The results of our evaluation are summarized on the front page of the evaluation, with indications where we have found our action to "not likely to adversely affect" and where we have found our action to have "no effect." For each approval for which our biological evaluation has found "not likely to adversely affect," as distinguished from a "no effect" finding, please consider this letter to be a request to initiate informal consultation under Section 7 of the Endangered Species Act. It is our hope that the consultation process may be concluded expeditiously with your concurrence on each finding of "not likely to adversely affect." While we are not required to



consult with the Service on actions that we determine have no effect on listed species, nor receive concurrence from the Service, we are providing these determinations to you for your information.

We believe the TMDL was established by the State at a level necessary to attain and maintain applicable water quality standards as established by the State. We acknowledge that the Service and EPA have initiated informal consultation on EPA's approval of the State's water quality standards. In particular, our two agencies are using the January 2001 memorandum of agreement ("MOA") between our agencies as a guide for this consultation effort. If the water quality standards consultation results in a change to the standards or their interpretation, we will, as appropriate, revisit our conclusions on how TMDL approvals may affect applicable species.

EPA's approval of a TMDL does not involve the direct commitment of resources and does not authorize any activities affecting applicable species. Finally, EPA's approval of a TMDL does not create any new authorities for controls on nonpoint sources of pollution. Nor does our approval of a TMDL itself result in the implementation of the load allocations in a TMDL as it applies to nonpoint sources.

We appreciate your review and action on the proposed TMDL approval actions. We also welcome to any suggestions you might have on the form or content of our biological evaluations. Feel free to call Bruce Zander (303/312-6846) of our staff if you have questions regarding this matter.

Sincerely,



Karen Hamilton, Chief
Water Quality Unit

Enclosures

cc: Jack R. Tuholske, Attorney
401 North Washington
P.O. Box 7458
Missoula, MT 59807

Claudia Massman, Attorney
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Alan Joscelyn
Gough, Shanahan, Johnson and Waterman
33 Last Chance Gulch
Helena, MT 59601

May 1, 2003

**Biological Evaluation of
Proposed Total Maximum Daily Loads (TMDLs)
Montana**

Summary Information

Waterbody:	Big Creek	
Basin/HUC	North Fork Flathead River Basin/17010206	
County(ies)	Flathead County	
Species of concern	<u>Bull Trout</u> (threatened) <u>Bald Eagle</u> (threatened; proposed delisting) <u>Grizzly Bear</u> (threatened) <u>Gray Wolf</u> (endangered) <u>Canada Lynx</u> (threatened) <u>Spalding's Catchfly</u> (threatened)	
Pollutant/ Effect of Action	sediment	Bull Trout.....not likely to adversely affect Bull Trout PC habitat...not likely to adversely affect Bald Eagle.....not likely to adversely affect Grizzly Bear.....not likely to adversely affect Gray Wolf.....no effect Canada Lynx.....no effect Spalding's Catchfly..... no effect

Office of Ecosystems Protection and Remediation
US Environmental Protection Agency
Region VIII
Denver, Colorado

May 1, 2003

Introduction

Section 7(a) of the Endangered Species Act ("ESA"), 16 U.S.C. Section 1536(a), requires that each federal agency

- in consultation with the U.S. Fish and Wildlife Service ("FWS"),¹ insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species or to result in the destruction or adverse modification of any designated critical habitat of each such species (§7(a)(2)); and
- confer with the FWS on any agency action that is likely to jeopardize the continued existence of any species that is proposed for listing or to result in the destruction or adverse modification of any critical habitat proposed to be designated for any such species (§7(a)(4), emphasis added.)

A biological evaluation may provide an analysis of the potential effects of a proposed federal agency action on any listed, proposed, and candidate species or the designated critical habitat of any such species, based on the best scientific or commercial information available.

The federal action that is the subject of this biological evaluation is the Environmental Protection Agency's (EPA's) proposed approval of the total maximum daily load ("TMDL") described below, which the State of Montana has submitted to EPA. According to section 303(d) of the Clean Water Act ("CWA"), states are required to develop and submit to EPA TMDLs for pollutants discharged into waters for which certain technology-based controls on point source dischargers as required by the CWA are not expected to be adequate to ensure implementation of applicable water quality standards. EPA must either approve or disapprove each TMDL and, in the event of a disapproval, establish a TMDL itself.

TMDLs do not, in themselves, authorize any discharge of pollutants or create new regulatory authority to control pollutants. Rather, TMDLs rely on existing mechanisms to be implemented. These mechanisms include regulatory programs such as the CWA National Pollutant Discharge Elimination System ("NPDES") permit program and voluntary actions, including management measures or other controls by federal, state, local governments, Indian tribes, or individuals. Once EPA approves a TMDL that includes a point source wasteload allocation component, effluent limits in subsequent NPDES permits for the relevant waterbody must be consistent with the assumptions and requirements of that wasteload allocation. (See 40 C.F.R. Section 122.44(d)(1)(vii)(B).) Once EPA approves a TMDL that includes a load allocation component addressing nonpoint sources, there is wide discretion regarding how or whether that load allocation may be implemented. Past experience has been that when nonpoint source components of a TMDL are implemented, it is through a voluntary, incentive-based program at the federal, state, tribal, or local level.

¹ For certain actions not relevant here, federal agencies consult with the National Marine Fisheries Service instead.

This biological evaluation has been prepared to assist the EPA and FWS in carrying out their activities pursuant to ESA Sections 7(a)(2) and 7(a)(4) as they pertain to EPA's approval of the TMDL(s) described below.

Proposed Action

EPA proposes to approve a TMDL established by the state of Montana for the control of certain pollutants discharged into Big Creek (Creek), a tributary of the North Fork of the Flathead River. In particular, this TMDL is designed to achieve a reduction of sediment found in the stream to improve the aquatic life and bull trout habitat.

In approving a state-submitted TMDL, EPA affirms that the TMDL (1) has been established at a level necessary to attain and maintain the applicable water quality standards and (2) has the necessary components for a TMDL. The necessary components that make up a TMDL are expressed in Region VIII's checklist for TMDL review (see attached Table.) EPA's approval of the TMDL does not authorize, fund, or require any aspect of TMDL implementation as described in the TMDL submittal from the state. Likewise, EPA's approval of a nonpoint source TMDL such as this one does not create any new authorities or requirements.

The TMDL EPA proposes to approve addresses the narrative standards adopted by the state of Montana that prohibit excessive amounts of sediment which could result in impairment of designated uses. The overall target of this TMDL is to reduce the amount of sediment yield from the watershed to less than 30 percent instream fine sediment.

Excessive sediment and scour of a channel bed can have a negative effect on aquatic life in several ways. Examples of negative effects on aquatic life include problems associated with spawning, migration, food supply, juvenile rearing, and fry emergence. Elevated levels of fine sediment can fill pools and other depositional habitats which reduces living space for fish including hiding, security, and winter cover. They can reduce fish egg survival in gravels by smothering the eggs resulting in the lack of oxygen, or by entrapment of pre-emergent alevins (young fish with egg sacs) in the substrate. Fine sediment can also affect the composition and production of the aquatic insect community which important food sources for fish including juvenile bull trout.

There are no point sources of sediment in this watershed. Hence, this TMDL focuses on nonpoint sources. EPA's TMDL regulations define the nonpoint source and natural background component of a TMDL as the "load allocation." "Load allocation" is defined as the portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. (see 40 C.F.R. §130.2(g).)

TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure (see 40 C.F.R. 130.2(i).) In the case of the Big Creek, the TMDL is expressed in terms of a reduction in sediment load to less than 30 percent fine sediment to result in improved levels of sediment in the stream.

The source of sediments in Big Creek is a combination of natural and man-caused upland and stream channel erosion. Big Creek is formed in a glacial valley where natural streambank erosion rates are high. The past construction of roads and logging skid trail networks on both national forest and private lands have caused an increased sediment load to Big Creek. Between 1980 and 1990, the percentage of fine sediments in the substrate increased from 23 to 53 percent. While silvicultural practices are likely the primary sources of impairment, recreation such as ski area development and roads maintained primarily for recreational activities contribute to the sediment load. Another large source of sediments was the Moose Fire in 2001 which burned 38 percent of the upper portion of the Big Creek watershed.

Although these water quality controls are described in the TMDL submittal from the state, EPA does not take action on implementation components of TMDLs and, as such, EPA's approval will not extend to the implementation components of the TMDL.

Geographic Scope of Action

Big Creek is located in Flathead County, Montana in the North Flathead River Basin. This creek is a tributary to the North Fork of the Flathead River. Big Creek is a 77 square mile watershed with elevation ranging from 3,300 feet to about 6,817 feet and about 14 miles long.

Any species that may be affected by the Big Creek TMDL are most likely aquatic or aquatic-dependent species. EPA has, however, identified no direct effects, indirect effects, interrelated, or interdependent effects associated with approval of this TMDL.²

² EPA's approval of a TMDL and associated wasteload allocations and load allocations does not add anything to the environmental baseline nor will it result in any physical addition or alteration of any kind to the environment. Thus, EPA's approval of the State's numerical calculations has no direct effect on T&E species. It is only when the numerical load calculations are implemented that additions or alterations to the environmental baseline, or effects, are expected to occur.

EPA's action in this instance is the establishment of the Big Creek sediment TMDL and associated allocations. The TMDL is the expression of the amounts of sediment that can enter the waterbody without resulting in a violation of applicable water quality standards. Because there are no point sources involved in this TMDL, the "wasteload allocation" component of the TMDL attributed to point sources is zero. Regarding nonpoint sources, the TMDL establishes a load allocation that is less than what is currently entering the system. Because the sum of the loads established in the TMDL is less than the sum of the loads currently entering the Creek, EPA views its action as ultimately beneficial. Measures to implement nonpoint source load

Of the ESA listed, proposed, and candidate species in Flathead County, the only aquatic or aquatic-dependent species are the **bull trout** (threatened), **bald eagle** (threatened), and the **grizzly bear** (threatened.) The non-aquatic dependent listed, proposed, and candidate species which may occur in the area of the proposed TMDL include the **gray wolf** (endangered), **Canada lynx** (threatened), and the **Spalding's catchfly (campion)** (threatened.)

(The ESA does not require evaluation or consultation of effects on candidate species. An evaluation is nevertheless provided below for informational purposes and to prompt evaluation of changes or alternatives to the proposed action if the proposed action is found to have an adverse effect on the candidate species.)

■ ■ ■

Evaluation of Action on Bull Trout (*Salvelinus confluentus*)

Status: Threatened

Range: The historic range of the bull trout included the Pacific northwest sector of the United States as well as the northwest territories in Canada and possibly Alaska. The current range includes ID, MT, NV, OR, and WA. They are native to streams, rivers, and lakes in northwestern Montana. They are found in the Flathead basin including Flathead Lake as well as many of the tributaries including Big Creek a tributary of the North Fork of the Flathead River.

Habitat: Bull trout are found primarily in upper tributary streams and several lake and reservoir systems; they have been reduced in from the main stems of most of the large rivers. Bull trout are opportunistic feeders. Juvenile bull trout feed on terrestrial and aquatic insects, macrozooplankton, amphipods, mysids, crayfish, and small fish. Adults are primarily piscivorous feeding on other fish species but will also take other prey including frogs and ducklings. Bull trout fry generally use shallow, low velocity areas with an abundance of instream overhead cover in the form of cobble, boulder, and rootwads. Juvenile bull trout use slightly deeper, faster areas of side channels that have an abundance of overhead cover in the form of boulder and woody debris. Factors contributing to their decline include habitat degradation and loss due to land and water management practices; isolation and fragmentation of populations by both structural (e.g., dams) and environmental (e.g., thermal or pollution) barriers; introduction of non-native fishes resulting in competition, predation and hybridization threats; historical eradication efforts; poisoning to remove non-game species; historical overharvest; and ongoing poaching and accidental harvest due to misidentification.

allocations, however, are beyond the scope of EPA's authority to require. Because EPA does not have authority to prescribe actions to effectuate load allocation, implementation of load allocations depends upon planning and implementation actions by State agencies, other federal agencies, local governments, and/or private landowners pursuant to State, local, and federal authorities that do not derive from the Clean Water Act.

Critical habitat for the Klamath River and Columbia River Basin population segments of the bull trout have been proposed by the U.S. Fish & Wildlife Service in the November 29, 2002, Federal Register (67 Fed. Reg. 71236 November 29, 2002.) These proposed designations are for only areas currently known to be essential to the conservation of the bull trout. Unit 2 which is the Clarks Fork River Basin, includes the Flathead Lake critical habitat subunit (CHSU.) This subunit includes, with some exceptions, the entire Flathead River basin upstream from Kerr Dam. Big Creek is included within the Flathead River Basin from its confluence with the North Fork Flathead River upstream 11.4 miles to a natural barrier in the headwaters.

The proposed critical habitat document includes nine primary constituent elements (PCEs) for bull trout pertaining to their habitat requirements, life-history characteristics, and population biology. One of the nine primary elements that relate to the TMDL is the requirement of substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival (PCE #4.) A minimal amount of fine substrate less than 0.63 cm (0.25 inches) in diameter and minimal substrate embeddedness are characteristic of these conditions.

Evaluation:

Effect of sediment TMDL on the bull trout and proposed critical habitat: Existing studies suggest that fine sediment (sediment particles smaller than 6.35 mm (0.25 inches) in diameter) smothers eggs and fry of bull trout. In particular, high levels of fine sediment can reduce embryo survival by: 1) decreasing gravel permeability; 2) slowing rate of metabolic waste flushing; and 3) interfering with emergence by filling interstitial space through which the fry emerge. Primary critical element number 4 mentioned above reiterates the importance of substrates and sediment. Further, PCE numbers 3 (stream channel), 8 (food base), and 9 (competitive nonnative species) may also be affected by high levels of sediment. Research on substrate fine sediment effects on bull trout have concluded that survival of bull trout embryos are mostly unaffected up to a composition of 30% fines in spawning substrates (Shepard *et al.* 1984). Weaver and Fraley (1991) indicated that fines above 35% resulted in decreased survival of bull trout. Rieman and McIntyre (1991) concluded:

"In the absence of detailed local information on population habitat dynamics, any increase in the proportion of fines in substrates should be considered a risk to productivity of an environment and to the persistence of associated bull trout populations."

The Big Creek TMDL establishes 3 water quality targets associated with the reduction of sediment (see Section 3.0 Water Quality Objectives (TMDL Targets)). One target is a level of interstitial sediment fines which is believed to be protective of bull trout. The target is expressed in terms of a percent fines reading using the McNeil Core methodology. The percent fines target is based on reference conditions in Big Creek, which were experienced during the years 1981 through 1987. After 1987, the percent fines increased significantly most likely in response to upland erosional processes.

The best that has been seen in the Big Creek system using the McNeil core sampling protocol is 21.6% fines and the worst at 53.4% fines (based on data taken from 1981 through year 2000 in Big Creek at the Skookoleel bridge crossing.) The reference condition was characterized by the mean percent fine sediment during the reference period...a reading of 27.4% fines. In defining a reference condition and determining compliance with water quality standards (fully supporting beneficial uses), consideration is given to variation in the natural system as well as variability in the sampling and analysis methodology used to compare conditions. One standard deviation from the mean of 27.4% fines over the reference period is ± 3.63 . Therefore the target selected for percent fines is the reference condition, with the allowance of one standard deviation to account for natural variation and sampling and analysis methods. This translates to a target of between 23.77 and 31.03% fines. Further, to incorporate a margin of safety, the upper bound of this target is set at a value less than 30% fines less than 6.4 mm based on McNeil Core sampling.

As more percent fines readings are taken, it may be appropriate to reduce the target based on an increased understanding of the uncertainty associated with the natural variation of the percent fines target and the sampling methodology. The upper bound of the target range (i.e., 30% fines) is 5% less than the 35% threshold for a "threatened" stream as recommended by the Flathead Basin Commission's report "Flathead Basin Forest Practices Water Quality and Fisheries Cooperative Program Final Report" (1991). This modification from 35% to 30% applies only to Big Creek since historic percent fines data from Big Creek indicates that the lower level is achievable and consistent with Montana Department of Environmental Quality criteria for making beneficial use support determination (Water Quality Assessment Process and Methods, Appendix A as found in Montana's year 2000 Section 303(d) waterbody list submittal).

The second and third targets established in the Big Creek TMDL also relate to reduction of sediment within the watershed. The second target is to reduce the amount of streambank erosion occurring in the most sensitive impaired reaches of Big Creek. A successful measure of this target would be that the erosion rate of the monitored impaired reaches is not significantly greater than 125% of the erosion rate of the monitored reference reaches, based on statistically valid comparison. The third target is to reduce the sediment input from upland and stream channel sources. The measure of the achievement of this objective would be the successful revegetation and/or armoring of at least 75% of the identified sediment sources.

EPA concludes that the water quality percent fines target used in the Big Creek TMDL is within the variability of an unimpaired condition for Big Creek. The loss of fry due to substrate conditions is at levels corresponding to the TMDL water quality target and

within the range of loss expected in an unimpaired condition. Further, EPA concludes that the other sediment reduction targets in the TMDL will contribute to the overall sediment health of the habitat and aquatic species.

EPA Finding: EPA concludes that its approval of the Big Creek sediment TMDL **will not adversely affect** the bull trout or proposed critical habitat because the proposed action will be beneficial to the species.

Evaluation of Action on the Bald Eagle (*Haliaeetus leucocephalus*)

Status: Threatened; Proposed for Delisting

Range: Entire lower 48 states

Habitat: Quiet coastal areas, rivers or lakeshores with large, tall trees.

Evaluation:

Effect of sediment TMDL on bald eagle: Fish are the primary food source for the bald eagle, but bald eagles also take a variety of birds, mammals, and turtles when fish are not readily available. Under certain conditions, excessive sediment can have negative effects on the health of fish. The purpose of the Big Creek TMDL is to establish goals for improving the level of sediment in the Creek. If implemented, the Big Creek TMDL should result in improved levels of aquatic life in the Creek as a result of the improved levels of sediment.

EPA Finding: EPA concludes that its approval of the sediment TMDL for Big Creek will **not likely adversely affect** the bald eagle because the proposed action will be beneficial to the species.

Evaluation of Action on Grizzly Bear (*Ursus arctos horribilis*)

Status: Threatened

Range: The historic range of the grizzly bear covered much of North America from the mid-plains westward to California and from central Mexico north throughout Alaska and Canada. The current range includes CO, ID, MT, WA, and WY. Grizzly bears found in the Big Creek area are part of the Northern Continental Divide ecosystem which includes Glacier National Park, parts of the Flathead and Blackfoot Indian Reservations, parts of five national forests (Flathead, Helena, Kootenai, Lewis and Clark, and Lolo), BLM lands, and a significant amount of state and private lands.

Habitat: The grizzly bears habitat includes diverse forests interspersed with moist meadows and grasslands in or near mountains. The bear is an omnivore with a diet that includes insects, wild honey, grasses, sedges, roots, mountain sorrel, buffalo berries, fish, moose, elk deer, and bighorn. Thus, aquatic species such as fish are a small but sometimes important part of the bears' food source.

Evaluation:

Effect of sediment TMDL on the grizzly bear: The proposed TMDL approval would not result in the loss or degradation of the grizzly bear's habitat. Any reduction in sediments should result in the improvement of habitat for aquatic life, including species upon which the grizzly bear feeds.

EPA Finding: EPA concludes that its approval of the sediment TMDL for Big Creek will **not likely adversely affect** the grizzly bear because any effects that the proposed action will have on the species will be insignificant but beneficial.

Evaluation of Action on Gray Wolf (*Canis lupus*)

Status: **Endangered**

Range: The current range of species includes CO, ID, MI, MT, ND, SD, WI, and, WY.

Habitat: Forested areas.

Evaluation:

Effect of sediment TMDL on the gray wolf: The proposed federal action does not result in the loss or degradation of the gray wolf's habitat. Further, the effect of the federal action will be limited to aquatic or aquatic-dependent species.

EPA Finding: EPA concludes that its approval of the sediment TMDL for Big Creek will have **no effect** on the gray wolf.

Evaluation of Action on Canada Lynx (*Lynx canadensis*)

Status: **Threatened**

Range: The current ranges includes CO, ID, ME, MI, MN, MT, NH, NY, OR, UT, VT, WA, WI, and WY.

Habitat: The habitat for the lynx includes spruce/fir forests of the high mountains. They feed on snowshoe hare, which live in dense thickets of younger trees and shrubs.

Evaluation:

Effect of sediment TMDL on the Canada lynx: This proposed federal action does not result in the loss or degradation of Canada lynx habitat. Further, any effects of the federal action will be limited to aquatic or aquatic-dependent species.

EPA Finding: EPA concludes that its approval of the sediment TMDL for Big Creek will have **no effect** on the Canada lynx.

Evaluation of Action on the Spalding's catchfly (campion) (*Silene spaldingii*)

Status: Threatened

Range: The current range of the Spalding's catchfly is ID, MT, OR, and WA.

Habitat: This species is primarily restricted to mesic (not extremely wet nor extremely dry) grasslands (prairie or steppe vegetation) that are found in southeastern Washington, northwestern Montana, and adjacent portions of Idaho and Oregon. A certain number of plants have also been located in British Columbia. This species is typically associated with grasslands dominated by native perennial grasses (see 64 Fed. Reg. 67814, December 3, 1999).

Evaluation:

Effect of sediment TMDL on the Spalding's catchfly: This proposed federal action does not result in the loss or degradation of Spalding's catchfly habitat. Further, any effects of the federal action, if any, will be limited to aquatic or aquatic-dependent species.

EPA Finding: EPA concludes that its approval of the sediment TMDL for Big Creek will have **no effect** on the Spalding's catchfly.

■ ■ ■

Conclusions

EPA concludes that its approval of the sediment TMDL for the Big Creek TMDL will not likely adversely affect the bald eagle, the grizzly bear, bull trout or bull trout proposed critical habitat. Further, EPA concludes that its approval will have no effect on the gray wolf, the Canada lynx, or the Spalding's catchfly.

References

- Reiman, B.E. and J.D. McIntyre. 1993. Demographic and habitat requirements for conservation of bull trout. U.S. Dep. Agric., For. Serv. Intermountain Res. Sta., Odgen, UT. Gen. Tech. Rep. INT-302.
- Shepard, B.B., S.A. Leathe, T.M. Weaver, and M.D. Enk. 1984. Monitoring levels of fine sediment within tributaries to Flathead Lake, and impacts of fine sediment on bull trout recruitment. Pages 146-156 in F. Richardson and F.H. Hamre, editors. Wild Trout III. Trout Unlimited, Vienna, Virginia
- U.S. Fish and Wildlife Service. 2002. Proposed Rule and Notice 50 CFR Part 17 Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for the Klamath River

and Columbia River Distinct Population Segments of Bull Trout and Notice of Availability of the Draft Recovery Plan; Federal Register Vol. 67, No. 230; November 29, 2002 (71236)

Weaver, T. and J. Fraley. 1991. Fisheries Habitat and Fish Populations. Flathead Basin Forest Practices Water Quality and Fisheries Cooperative Program. Flathead Basin Commission. Kalispell, Montana.

TMDL Review Criteria US EPA; Region VIII

Review Criteria (All criteria must be met for approval).
■ TMDLs result in maintaining and attaining water quality standards <i>(including the numeric, narrative, use classification, and antidegradation components of the standards; the "phased" TMDL can be used where there is a level of uncertainty; in addition, TMDLs can rely on either regulatory or voluntary approaches to attain standards);</i>
■ TMDLs have a quantified target or endpoint <i>(a numeric water quality standard often serves as the target, but any indicator or set of indicators which represent the desired conditions would suffice);</i>
■ TMDLs include a quantified pollutant target, but this target can be expressed in any appropriate manner <i>(According to EPA reg (see 40 CFR 130.2(i)) TMDLs need not be expressed in pounds per day or concentration when alternative means of expression are better suited to the waterbody problem; TMDLs can be expressed as mass per unit of time, toxicity, % reduction in sediment or nutrients, or other measure);</i>
■ TMDLs must consider all significant sources of the stressor of concern <i>(all sources or causes of the stressor must be identified or accounted for in some manner; this accounting can lump several sources of unknown origin together;</i>
■ TMDLs are supported by an appropriate level of technical analysis <i>(allocations for nonpoint sources are often best professional estimates whereas waste load allocations for point sources are often based on a more detailed analysis);</i>
■ TMDLs must contain a margin of safety and consider seasonality <i>(a margin of safety can be either explicit or implicit in the analysis or assessment);</i>
■ TMDLs apportion pollutant loads among sources <i>(allocations may be expressed in a variety of ways such as by individual discharger, by tributary watershed, by source or land use category, by land parcel, or other appropriate scale or dividing responsibility);</i>
■ TMDLs shall be subject to public review <i>(public participation should be in accordance with the State's continuing planning process ("CPP").)</i>